

CLAIMS

1. A method for coding or decoding an image, comprising:
providing global motion parameters associated with a current image frame;
deriving local motion vectors from the global motion parameters for individual
macroblocks in the current image frame;
5 using the local motion vectors to identify reference blocks in a reference frame; and
using the identified reference blocks to encode or decode the macroblocks in the
current image frame.

2. A method according to claim 1 including:
10 identifying four global motion vectors associated with corners of the current image
frame; and
generating the local motion vectors by interpolating the four global motion vectors to
locations of the macroblocks in the current image frame.

15 3. A method according to claim 1 including deriving the local motion vectors
from the global motion parameters as follows:

$$\underline{v}(x, y) = \underline{r}^0 + \left(\frac{x}{H-4} \right) \underline{r}^x + \left(\frac{y}{V-4} \right) \underline{r}^y + \left(\frac{x}{H-4} \right) \left(\frac{y}{V-4} \right) \underline{r}^{xy} \quad (1)$$

where \underline{v}^{00} , \underline{v}^{H0} , \underline{v}^{0V} , and \underline{v}^{HV} represent the global motion parameters at four corners of
the current image frame, (0,0), (H-4, 0), (0, V-4), and (H-4, V-4), respectively; x and y
20 represent an upper-left pixel location for the macroblock; and \underline{r}^0 , \underline{r}^x , \underline{r}^y , and \underline{r}^{xy} are the
following:

$$\underline{r}^0 = \underline{v}^{00}$$

copying the identified reference blocks for the copy type macroblocks; and
adding encoded residuals to the identified reference blocks for the residual type
macroblocks.

5 8. A method according to claim 1 including:

encoding and decoding some of the macroblocks in the current image frame using
global motion vector coding where the global motion parameters are used to generate local
motion vectors for the macroblocks; and

encoding and decoding other macroblocks in the current image frame using another
10 coding scheme.

9. A method according to claim 1 including:

generating subblock local motion vectors for individual subblocks in the same
macroblocks using the global motion parameters;

15 identifying individual reference subblocks in the reference frame pointed to by the
subblock local motion vectors; and

separately encoding and decoding the subblocks using the identified reference
subblocks.

20 10. A decoder, comprising:

a processor decoding encoded image frames by deriving local motion vectors for
identified macroblocks, the local motion vectors derived from global motion estimation
parameters associated with the image frames, the processor using the local motion vectors to

identify reference blocks in a current reference frame and then using the reference blocks to reconstruct the macroblocks in a current frame.

11. A decoder according to claim 10 wherein the processor generates the local
5 motion vectors by interpolating the global motion estimation parameters to locations of the macroblocks in the current frame.

12. A decoder according to claim 10 wherein the processor detects code words
10 included along with the encoded image frames that identify global motion vector coded macroblocks.

13. A decoder according to claim 12 wherein the code words indicate when the
macroblocks are a direct copy of the reference blocks.

14. A decoder according to claim 12 wherein the code words indicate when
15 residuals are added to the reference blocks to reconstruct the macroblocks.

15. A decoder according to claim 10 wherein the processor uses the global motion
estimation parameters to generate local motion vectors for different subblocks, the processor
20 using the local motion vectors to identify different reference subblocks in the current reference frame and then using the identified reference subblocks to reconstruct the subblocks in the current frame.

16. An encoder, comprising:

a processor encoding an image frame by encoding a set of global motion estimation parameters for an image frame and identifying macroblocks in the image frame that have local motion estimation parameters derived during decoding from the global motion estimation parameters.

17. An encoder according to claim 16 wherein the global motion estimation parameters include global motion vectors associated with corners of the image frame.

18. An encoder according to claim 17 wherein the processor compares the global motion estimation parameters with block motion estimation parameters to determine which macroblocks use the local motion estimation parameters derived from the global motion estimation parameters.

19. An encoder according to claim 16 wherein the processor generates codewords that identify the macroblocks that derive the local motion estimation parameters from the global motion estimation parameters.

20. An encoder according to claim 16 wherein the processor identifies macroblocks that are directly copied from reference blocks pointed to by the local motion estimation parameters derived from the global motion estimation parameters.

21. An encoder according to claim 16 wherein the processor encodes residuals for the identified macroblocks but no local motion estimation parameters.

22. An encoder according to claim 16 wherein the processor performs run length coding on the encoded image frame.

23. An encoder according to claim 16 wherein the macroblocks are $N \times N$ pixel arrays, where N is an integer; the subblocks are $M \times M$ pixel arrays, where M is an integer less than or equal to N .

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